

## **REMARKS**

Claims 1-21, all the claims pending in the application, stand rejected on prior art grounds. Applicants respectfully traverse these rejections based on the following discussion.

### **I. The Prior Art Rejections**

Claims 1, 5-9, 13-15, and 19-21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Poznanski, et al. (U.S. Patent No. 6,397,174), hereinafter referred to as Poznanski, in view of Odell (U.S. Patent No. 6,668,243). Claims 2-3, 10-11, and 16-17 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Poznanski, in view of Odell, in further view of Bahl, et al. (U.S. Patent No. 4,759,068), hereinafter referred to as Bahl. Claims 4, 12, and 18 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Poznanski, in view of Odell, in further view of Lee, et al. (U.S. Patent No. 7,165,019), hereinafter referred to as Lee. Applicants respectfully traverse these rejections based on the following discussion.

The claimed invention provides methods, computer systems, and computer program products for language modelling for mixed language expressions. More specifically, as described in paragraph 0014 of Applicants' disclosure, the next word within a sentence can be predicted for *mixed language* expressions. This next word can be of the same language as the text of the previous words, or can be from another language.

As further described in paragraph 0015 of Applicants' disclosure, a database of word equivalence probabilities is used as required by a monolingual language generator. The monolingual language generator uses a mixed-language word history to generate a monolingual word history. The monolingual history is in turn used by a monolingual language model. A resulting next-word hypothesis is used by a next-word language change model, which uses word equivalence probabilities to convert the next word in the monolingual word hypothesis to the next word in the foreign language. *An expected mixed-language next word can be provided.*

In the rejection, the Office Action argues that the prior art of record discloses many features of the claimed invention. However, Odell does not determine a next word based on a "mixed language expression". Instead, Odell determines a next word based on a monolingual expression, i.e., words in a *single* language. Even if one were to combine the multilingual dictionary of Poz with the teachings of Odell, the word sequence (that the "next word" is derived from) would still be monolingual. Therefore, as explained in greater detail below, Applicants respectfully submit that the prior art of record does not teach or suggest the claimed invention.

Applicants traverse the rejections because the prior art of record fails to teach or suggest the claimed features of "determining a probability of a next word in a mixed language expression". Such features are defined in independent claims 1, 8, and 9 using identical language.

The Office Action expressly acknowledges that Poz fails to teach the limitation wherein the "[p]robability of said next word predicts a next word in said mixed language

expression” (Office Action, p. 5, para. 3). However, the Office Action argues that Poz discloses “a dictionary composed of monolingual or multilingual text” (Office Action, p. 5, para. 2). Moreover, the Office Action argues that Odell discloses speech recognition systems that determine the next word in a word sequence (Office Action, p. 5, para. 3). Nevertheless, Applicants submit that there is no suggestion or motivation to combine the teachings of Poz and Odell to arrive at the claimed invention.

More specifically, Odell does not determine a next word based on a “mixed language expression” (independent claims 1, 8, and 9). Instead, Odell determines a next word based on a monolingual expression, i.e., words in a *single* language. In other words, all of the words in the previous word sequence must be in the same language. Odell cannot predict the next word if the spoken word sequence is a “mixed language expression” (independent claims 1, 8, and 9).

Furthermore, Applicants submit that even if one were to combine the multilingual dictionary of Poz with the teachings of Odell, the word sequence (that the “next word” is derived from) would still be monolingual. In other words, the claimed invention takes a *mixed language* word sequence and predicts the next word. Odell takes a *monolingual* word sequence and predicts the next word. Poz discloses a multilingual dictionary (e.g., a French-English dictionary).

However, one of ordinary skill in the art would not be motivated to take the monolingual word sequence of Odell and translate the word sequence to a mixed language using the multilingual dictionary of Poz. Because the objective of Odell is to predict a next word, using the multilingual dictionary of Poz to go back to the previous

word sequence and translate it would be “working backwards”. Furthermore, there is no teaching or suggestion to translate the monolingual word sequence of Odell to a mixed language word sequence. Such a translation would consume time and resources without providing a benefit, i.e., does not help accomplish the goal of predicting the “next word”.

Accordingly, Applicants submit that Odell does not determine a next word based on a “mixed language expression”. Instead, Odell determines a next word based on a monolingual expression, i.e., words in a *single* language. Even if one were to combine the multilingual dictionary of Poz with the teachings of Odell, the word sequence (that the “next word” is derived from) would still be monolingual. Therefore, it is Applicants’ position that the prior art of record fails to teach or suggest the claimed features of “determining a probability of a next word in a mixed language expression” as defined in independent claims 1, 8, and 9.

Therefore, it is Applicants’ position that the prior art of record does not teach or suggest many features defined by independent claims 1, 8, and 9 and that such claims are patentable over the prior art of record. Further, it is Applicants’ position that dependent claims 2-7 and 10-21 are similarly patentable, not only because of their dependency from a patentable independent claims, but also because of the additional features of the invention they defined. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections.

## **II. Formal Matters and Conclusion**

In view of the foregoing, Applicants submit that claims 1-21, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary. Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0441.

Respectfully submitted,

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